The covalent model

International Baccalaureate · IB Diploma · Chemistry · HL · Vocabulary in context

Word	Example
covalent bond /ˈkəʊvələnt bɒnd/	A **covalent bond** is a shared pair of electrons.
intermolecular force /ˌɪntəməˈlekjʊlə fɔːs/	An **intermolecular force** acts between separate molecules.
shared pair	A **shared pair** of electrons forms a single covalent bond.
octet rule	The **octet rule** says atoms tend to have eight outer electrons.
incomplete octet	Boron can have an **incomplete octet** in a molecule.
lone pair /ləʊn peə/	Water has two **lone pair**s of electrons on its oxygen atom.
Lewis formula	A **Lewis formula** shows the bonds and the lone pairs.
coordination bond	A **coordination bond** uses two electrons from the same atom.
valence shell electron pair repulsion	**Valence shell electron pair repulsion** predicts the shape of a molecule.
electron domain	A lone pair counts as one **electron domain**.
molecular geometry	The **molecular geometry** of water is bent.
electronegativity /ɪˌlektrəʊŋgəˈtɪvɪti/	Fluorine has the highest **electronegativity** of all elements.

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polar bond	The O–H bond is a **polar bond**. O–H
polar /ˈpəʊlə/	The C–Cl bond is **polar** because chlorine is more electronegative. C–Cl
dipole moment /ˈdaɪpəʊl ˈməʊmənt/	CO2 has no **dipole moment** because it is symmetrical. CO2
covalent network structure	Diamond has a **covalent network structure** extending through the solid.
allotrope	Diamond is an **allotrope** of carbon.
delocalized /dɪˈlɒkəlaɪzd/	**Delocalized** electrons spread over several atoms.
silicon dioxide /ˈsɪlɪkən daɪˈɒksaɪd/	Quartz contains **silicon dioxide**.
London force	A **London force** holds iodine molecules together.
dipole–dipole force	A **dipole–dipole force** holds HCl molecules together. HCl
hydrogen bonding /ˈhaɪdrədʒn ˈbɒndɪŋ/	**Hydrogen bonding** gives water a high boiling point.
van der Waals force	A **van der Waals force** is a weak attraction between particles.
volatility /ˌvɒləˈtɪlɪti/	Bromine has a higher **volatility** than iodine.
chromatography /krəʊməˈtɒgrəfi/	**Chromatography** separates the dyes in ink.
stationary phase /ˈsteɪʃənəri feɪz/	The paper is the **stationary phase**.

Word	Example
mobile phase /ˈməʊbaɪl feɪz/	The solvent is the **mobile phase**: it moves up the paper.
retardation factor	The spot has a **retardation factor** of 0.5. 0.5
resonance structure	Benzene can be drawn as two of them: each is a **resonance structure**.
bond order	A double bond has a **bond order** of 2. 2
benzene /ˈbenziːn/	**Benzene** is a ring of six carbon atoms.
expanded octet /ɛkˈspændɪd ɒkˈtet/	An **expanded octet** shows more than eight electrons around a central atom.
formal charge /ˈfɔːml tʃɑːdʒ/	The best Lewis structure has a **formal charge** of zero on each atom.
sigma bond /ˈsɪgmə bɒnd/	A single bond is a **sigma bond**. σ
pi bond /paɪ bɒnd/	A double bond has one sigma bond and one **pi bond**. σ π
hybridization /ˌhaɪbrɪdaɪˈzeɪʃn/	**Hybridization** explains the four equal bonds in methane.
hybrid orbital	A **hybrid orbital** points towards a bonded atom.

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